

IN THE CLAIMS

Please amend the claims as follows:

1.-5. (Canceled).

6. (Currently Amended) A device comprising means for storing instructions, said instructions adapted to be executed by a processor of a computer, said instructions when executed by the processor executing a process comprising the steps of

(a) obtaining a first data set, the first data set comprising:

time history of fluid volumes for pumping,

time history of proppant volumes for pumping,

fluid properties,

proppant properties ~~if the fluid contains proppant~~, and

logs of geological information,

(b) providing the first data set to a computer, the computer having a processor capable of executing instructions, the computer further having electronic storage means with stored equations comprising hydraulic fracturing relationships,

(c) computing by said processor a first set of values by manipulating said first data set using said stored equations,

(d) determining from said first set of values the dimensions of a hydraulic fracture using a mesh of elements, said dimensions including fracture height and length, fracture width and fluid pressures as a function of time, wherein the elements are capable of being only partially active, further wherein ~~the recalculation of fully active elements is not required during determination-computing~~ of said first set of values,

(e) converting said first set of values into a set of output data, the output data representing fracture dimensions and pressures as a function of pumping time,

(f) displaying, transmitting, or printing the output data.

7. (Currently Amended) A method of designing a hydraulic fracture of a well, comprising:

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- (a) obtaining a first data set, the first data set comprising:
- time history of fluid volumes for pumping,
 - time history of proppant volumes for pumping,
 - fluid properties,
 - proppant properties ~~if the fluid contains proppant~~, and
 - logs,
- (b) providing the first data set to a computer, the computer having a processor capable of executing instructions, the computer further having electronic storage means with stored equations comprising hydraulic fracturing relationships,
- (c) computing by said processor a first set of values by manipulating said first data set using said stored equations,
- (d) determining from said first set of values the dimensions of a hydraulic fracture using a mesh of elements, said dimensions including fracture height and length, fracture width and fluid pressures as a function of time, wherein the elements are capable of being only partially active, further wherein ~~the recalculation of fully active elements is not required during determination~~ computing of said first set of values,
- (e) converting said first set of values into a set of output data, the output data representing fracture dimensions and pressures as a function of pumping time,
- (f) displaying the output data.

8. (Currently Amended) A method for monitoring or evaluating ~~the a~~ fracture of a well, comprising:

- (a) pumping a fracturing fluid into a wellbore,
- (b) obtaining a first data set, the first data set comprising the following:
- time history of fluid volumes for pumping,

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fluid properties, and

logs,

(c) providing the first data set to a computer, the computer having a processor capable of executing instructions, the computer further having electronic storage means with stored equations comprising hydraulic fracturing relationships,

(d) computing by said processor a first set of values by manipulating said first data set using said stored equations,

(e) determining from said first set of values the dimensions of a hydraulic fracture using a mesh of elements, said dimensions including fracture dimensions and fluid pressures as a function of time, wherein the elements are capable of being only partially active, further wherein the recalculation of fully active elements is not required during ~~determination~~ computing of said first set of values,

(f) converting said first set of values into a set of output data, the output data representing fracture dimensions and pressures as a function of pumping time,

(g) displaying the output data, and

(h) monitoring the pumping step (a) to determine fracturing performance ~~in real time~~.

9. (Currently Amended) A method of evaluating ~~the~~ a fracture of a well following a fracturing operation, comprising:

(a) fracturing a well,

(b) obtaining a first data set, the first data set comprising the following data points obtained during step (a):

time history of fluid volumes for pumping,

fluid properties, and

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logs,

- (c) providing the first data set to a computer, the computer having a processor capable of executing instructions, the computer further having electronic storage means with stored equations comprising hydraulic fracturing relationships,
- (d) computing by said processor a first set of values by manipulating said first data set using said stored equations,
- (e) determining from said first set of values the dimensions of a hydraulic fracture using a mesh of elements, said dimensions including fracture dimensions and fluid pressures as a function of time, wherein the elements are capable of being only partially active, further wherein the recalculation of fully active elements is not required during ~~determination~~ computing of said first set of values,
- (f) converting said first set of values into a set of output data, the output data representing fracture dimensions and pressures as a function of pumping time,
- (g) displaying the output data.

10. (Currently Amended) An article of manufacture, comprising:

- (a) magnetic storage means having encoded thereon instructions,
- (b) a computer, the computer having a processor, wherein the processor is operably connected to said magnetic storage means,
- (c) wherein data is provided representing the time history of fluid volumes, fluid properties, and proppant properties required to fracture a ~~reservoir~~ well of a reservoir,
- (d) the processor being adapted to calculate values that correlate to said data, the values representing physical properties related to the reservoir or well fracturing operations using fluids, the values being used to estimate fracturing fluid performance,

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(e) the processor being capable of processing such data using numerical methods that subdivide a fracture numerical mesh into elements for purposes of calculation, said elements being generally capable of adopting a status as fully active, partially active, or inactive for calculation purposes, further wherein recalculation of fully active elements is not required.

11.- 20. (Canceled)